



PATENT APPLICATION
Mo6251
WW-5583

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION OF)
WOLFGANG DANNHORN ET AL) GROUP: 1623
SERIAL NUMBER: 09/923,011) EXAMINER:
FILED: August 3, 2001) Everett White
TITLE: A PROCESS FOR PREPARING)
ALKYLHYDROXYALKYL CELLULOSE)

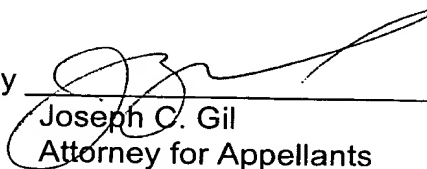
LETTER

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Enclosed herewith is an Appeal Brief in the matter of the subject Appeal.
Please charge the fee for filing the Brief, \$330.00, to our Deposit Account Number
13-3848.

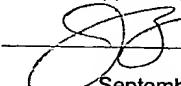
Respectfully submitted,

By 
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Date

Joseph C. Gil, Reg. No. 26,602
Name of applicant, assignee or Registered Representative


Signature
September 21, 2004
Date



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APPEAL BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This Brief, is an appeal from the Final Office Action of the Examiner dated November 20, 2003, in which rejection of Claims 1-7 was maintained. A separate Petition for Extension of Time Under 37 CFR 1.136(a) is being filed simultaneously herewith.

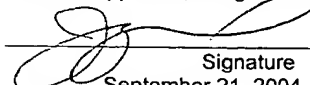
I. REAL PARTY IN INTEREST

The real party in interest for the present appeal is the assignee Wolff Walsrode AG.

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Date

Joseph C. Gil, Reg. No. 26,602
Name of applicant, assignee or Registered Representative


Signature
September 21, 2004
Date

II. RELATED APPEALS AND INTERFERENCES

Appellants are unaware of other appeals or interferences that will directly affect or be directly affected by or having a bearing on the present appeal.

III. STATUS OF CLAIMS

The above-referenced application was filed with Claims 1-7 all of which are pending but stand rejected. Claims 1-7 are the subject claims of this appeal.

IV. STATUS OF AMENDMENTS

Appellants filed a response but no amendments after final rejection.

V. SUMMARY OF THE INVENTION

The present invention is directed to a process for preparing alkylhydroxyalkyl celluloses from cellulose and alkylating agents in the presence of a caustic alkali solution and one or more suspension agents and also separation and purification of the reaction products, preferably by washing with hot water or washing with organic media. The process comprises a) alkalizing cellulose with an aqueous caustic solution containing from 1.5 to 5.5 equivalents of alkali metal hydroxide per anhydroglucose unit (AGU) of said cellulose, in the presence of a suspension agent which contains alkyl halide in an amount of from (equivalents of alkali metal hydroxide per AGU minus 1.4) to (equivalents of alkali metal hydroxide per AGU plus 0.8); b) reacting the alkalized cellulose of step a) with one or more alkylene oxides at a temperature higher than 65°C; c) adding alkyl halide, to the product of step b), in an amount of at least the difference between (i) the equivalents of alkyl halide per AGU in step a) and (ii) the equivalents of alkali metal hydroxide added per AGU in step a), provided that the amount of additionally added alkyl halide is at least 0.2 equivalents per AGU; d) isolating alkylhydroxyalkyl cellulose from the reaction mixture of step c); and e) optionally purifying the isolated alkylhydroxyalkyl cellulose.

VI. ISSUES

Whether Claims 1-7 are unpatentable under 35 U.S.C. 103 over the Breckwoldt patent (U.S. 5,166,333) in view of the Reibert et al patent (U.S. 6,235,893).

VIII. ARGUMENTS

Claims 1-7 are not anticipated by the Breckwoldt reference (U.S. Patent 5,166,333) or the Reibert et al patent (U.S. 6,235,893).

The Examiner alleges that it would have been obvious to one of ordinary skill in the art at the time the invention was made to include in the process for preparing methylhydroxypropyl cellulose of the Breckwoldt procedure that involves the alkalization of cellulose in the presence of an alkali halide in view of the recognition in the art, as suggested by the Reibert et al patent, that the presence of an alkali halide in the alkalization procedure enhances the gel strength of the cellulose ether (Office Action dated November 20, 2003, page 2, para. 5, line 11 to page 3, line 4).

It is well established that to establish a prima facie case of obviousness, the USPTO must satisfy all of the following requirements. First, the prior art relied upon, coupled with the knowledge generally available in the art at the time of the invention, must contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or to combine references. *In re Fine*, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). Second, the proposed modification must have had a reasonable expectation of success, as determined from the vantage point of one of ordinary skill in the art at the time the invention was made. *Amgen V. Chugai Pharmaceutical Co.* 18 USPQ 2d 1016, 1023 (Fed Cir., 1991), cert. denied 502 U.S. 856 (1991). Third, the prior art reference or combination of references must teach or suggest all of the limitations of the claims. *In re Wilson*, 165 USPQ 494,496, (CCPA 1970). The Examiner did not establish a prima facie case of obviousness.

Regarding Reibert et al, Reibert et al teaches a two-stage process for the production of methylhydroxypropyl cellulose:

1. cellulose is alkalized and then reacted with a methylating agent, and
2. after which it is realkalized and then once again reacted with a methylating agent.

In the first step at least such a quantity of alkali metal hydroxide is added that corresponds to 20% of the total quantity and a quantity of methylating agent is added that produces at least 20% of the total level of methoxy substitution. In the second step, at least such a quantity of alkali metal hydroxide is added that corresponds to 40% of the total quantity and such a quantity of methylating agent is added that produces at least 40% of the total level of methoxy substitution. Thus, Reibert et al teaches adding in each reaction step equivalent quantities of sodium hydroxide and a methylating agent to the cellulose to produce a methyl cellulose.

The two-stage process of Reibert et al is exemplified by the quantities disclosed in the examples. Reibert et al teaches equimolar quantities of sodium hydroxide and a methylating agent are added to the cellulose. As a result, a methyl cellulose is produced. However, there is no teaching or suggestion of producing methylhydroxyalkyl celluloses using ethylene oxide, propylene oxide or butylene oxide and no examples are provided.

Regarding Breckwoldt, Breckwoldt teaches the production of highly substituted MHPC by producing an alkali metal cellulose by reacting cellulose with sodium hydroxide and reacting the alkali metal cellulose with a hydroxypropylating reagent, optionally adding additional sodium hydroxide after the hydroxypropylation and conducting methylation by adding a methylating agent after hydroxypropylation. Breckwoldt discloses that the hydroxypropylation and methylation steps are completely separate. At the same time Breckwoldt describes the production of highly substituted MHPC by adding a second quantity of sodium hydroxide. Breckwoldt does for example provide a comparative example in which the presence of methyl chloride leads to undesirably low yields of a hydroxypropylating reagent.

Thus, according to the teaching of Breckwoldt, one skilled in the art would expect a high yield of a hydroxyalkylating reagent (in particular a hydroxypropylating reagent) if the etherification/hydroxyalkylation in the absence of methylating agents was practiced.

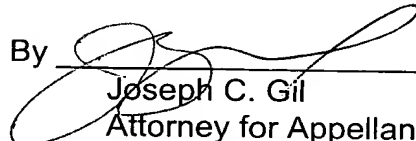
Surprisingly the process according to Appellants' invention does however provide advantages with regard to the reagent yields and the short reaction time and flexibility concerning the type of substitution and the degree of substitution. In this regard, the Honorable Board's attention is directed to the examples which clearly show the advantages of the present invention.

Appellants' process produces the alkali metal cellulose in one step (in contrast to Reibert et al) and uses the methylating agent at the same time as the hydroxypropylation phase (in contrast to Breckwoldt). In contrast to the Reibert et al process, this methylating agent is initially used in a substoichiometric quantity and then in a higher than stoichiometric quantity.

Thus, a combination of the teachings of Breckwoldt and Reibert et al would result in multi-stage alkalization, since Breckwoldt also describes multi-stage alkalization and provides examples thereof. The process according to Appellants' invention is however carried out in a single step. Accordingly, neither, Breckwoldt nor Reibert et al, either alone or in combination teach or suggest all the limitations of Appellants' invention.

Appellants therefore submit that the Examiner's rejection is in error and respectfully request that the rejection be reversed and that Claims 1-7 be allowed.

Respectfully submitted,

By 
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APPENDIX: CLAIMS ON APPEAL

1. A process for preparing alkylhydroxyalkyl cellulose comprising the steps of:
 - a) alkalizing cellulose with an aqueous caustic solution containing from 1.5 to 5.5 equivalents of alkali metal hydroxide per anhydroglucose unit (AGU) of said cellulose, in the presence of a suspension agent which contains alkyl halide in an amount of from (equivalents of alkali metal hydroxide per AGU minus 1.4) to (equivalents of alkali metal hydroxide per AGU plus 0.8);
 - b) reacting the alkalised cellulose of step a) with one or more alkylene oxides at a temperature higher than 65°C;
 - c) adding alkyl halide, to the product of step b), in an amount of at least the difference between (i) the equivalents of alkyl halide per AGU in step a) and (ii) the equivalents of alkali metal hydroxide added per AGU in step a), provided that the amount of additionally added alkyl halide is at least 0.2 equivalents per AGU;
 - d) isolating alkylhydroxyalkyl cellulose from the reaction mixture of step c); and
 - e) optionally purifying the isolated alkylhydroxyalkyl cellulose.
2. The process of Claim 1 wherein said suspension agent is dimethyl ether.
3. The process of Claim 1 wherein said alkyl halide is selected from the group consisting of methyl chloride, ethyl chloride, ethyl bromide and propyl iodide.
4. The process of Claim 2 wherein in step a), said alkyl halide is methyl chloride, and the parts by weight ratio of dimethyl ether to methyl chloride is in the range of 70:30 to 20:80.
5. The process of Claim 1 wherein said alkylene oxide is selected from ethylene oxide, propylene oxide, butylene oxide and mixtures thereof.

6. The process of Claim 1 wherein the temperature under which steps b) and c) are each performed is independently in the range of 65 to 110°C.

7. The process of Claim 1 wherein the alkylhydroxyalkyl cellulose prepared is methylhydroxypropyl cellulose (MHPC).